

建築 画報

MONOGRAPH

Visual Architecture 391

九段会館テラス KUDAN-KAIKAN TERRACE

歴史的建造物「旧九段会館」の
保存・建替えプロジェクト

搬出搬入動線が前面道路からの2方向に制約される中、土工事・地下躯体工事を円滑に進めるため、乗入れ構台面積は必要最小限としながらも、南北を繋いで北ゲートおよび南ゲートどちらからもアプローチ可能な計画とした。

新築エリアの掘削時には、保存エリアの既存杭先端部よりも遥かに深い深度となる。保存棟の健全性を保つためには山留めSMW連続壁の最大変位を10mm以下で抑える必要があった。そのため、保存棟基礎下部にアースアンカーを配置し、芯材のサイズを慎重に選定、また切り梁は敷地短辺方向のみ3段で計画し、作業効率にも配慮した計画とした。

また、仮設部材配置の検討時は、BIM活用により新築構造物との干渉を効率的に事前回避した。施工中の地下水対策として、揚水および復水効率に優れるSWP・VPRW工法を選定。掘削面積約3,000㎡に対して、揚水井戸2本、復水井戸2本で賄いドライワークの確保と工期短縮を図った。

土工事期間中は切り梁荷重計・変位計のほかに、保存棟基礎躯体に沈下計、牛ヶ淵に水位計を設置し、24時間の管理体制を敷くとともに井戸用の非常時電源も確保し、不意の地域停電に備える等、保存棟のタイムリーな沈下監視と、お濠の水位維持に配慮した計画とした。(神山 良知 | 鹿島建設)

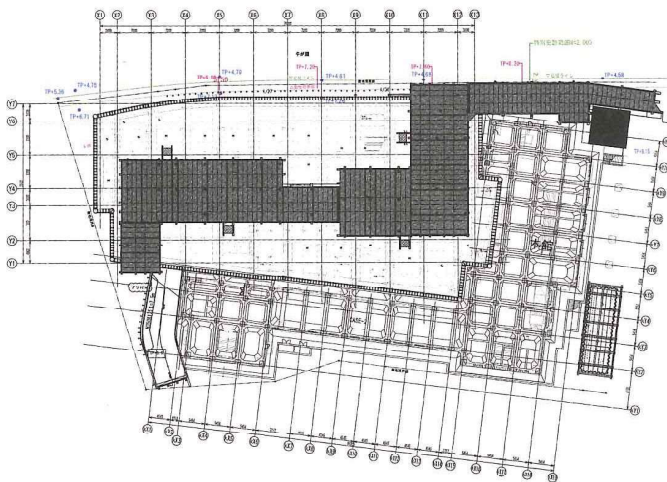
There were only two loading entrances from the road in front, so the gantry area was minimized for the sake of efficient earthwork and underground construction. The two entrance gates, created on the north and south sides, were connected and the site was thus approachable from both sides.

The excavation work for the new building would go far deeper than the existing piles supporting the preserved building. To maintain the integrity of the preserved building, it was necessary to keep the maximum displacement of the earth-retaining SMW (Soil Mix Walls) to below 10 mm. Therefore, earth anchors were placed at the bottom of the preserved building's foundation, the size of the core members was carefully determined, and the struts were placed in three layers only in the shorter direction of the site to ensure work efficiency.

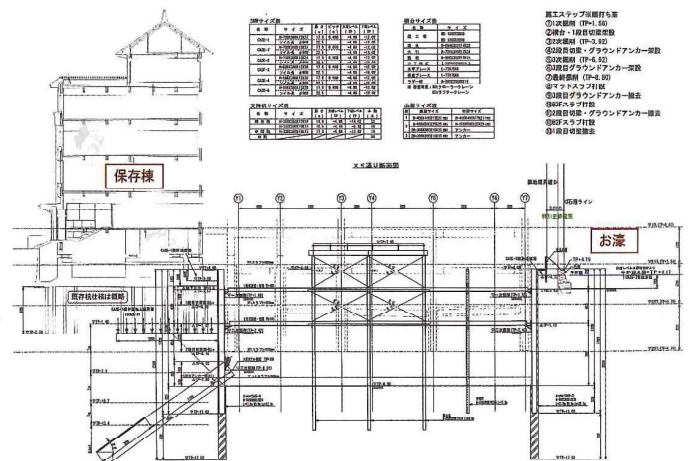
In addition, when considering the placement of temporary components, interference with the new structure was efficiently avoided in advance by using BIM (Building Information Modeling). The SWP (Super Well Point) and VPRW (Vacuum Press Recharge Well) methods were selected for groundwater control during construction because of their superior pumping and condensate efficiency. Two pumping wells and two condensate wells were used to ensure dry work and shorten the construction period for the excavated area of approximately 3,000 m².

During the earthwork period, in addition to the load and displacement measuring instruments for struts, settlement and water gauges were installed on the foundation frame of the preserved building for 24-hour monitoring. An emergency power supply for the well was also secured for unexpected power outages in the district. Other measures were implemented to ensure timely monitoring of the settlement of the preserved building and to maintain the water level of the moat.

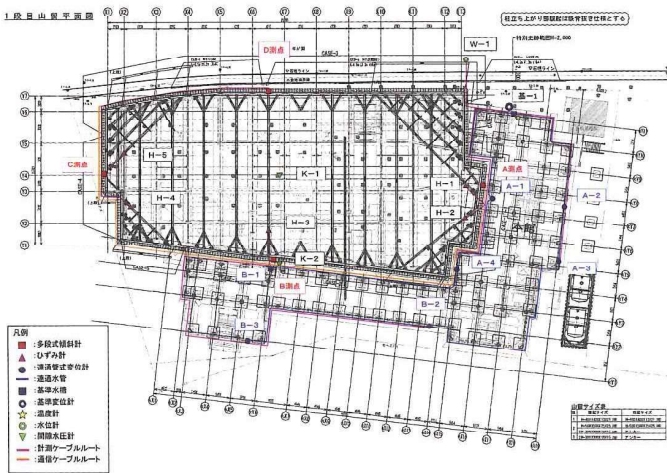
(Yoshikazu Kamiyama | Kajima Corporation)



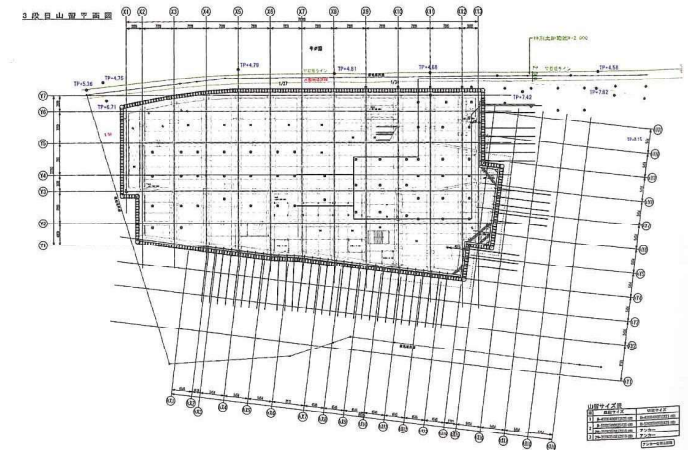
構台計画平面図 | Gantry area plan



山留め計画断面図 | Earth retaining plan section



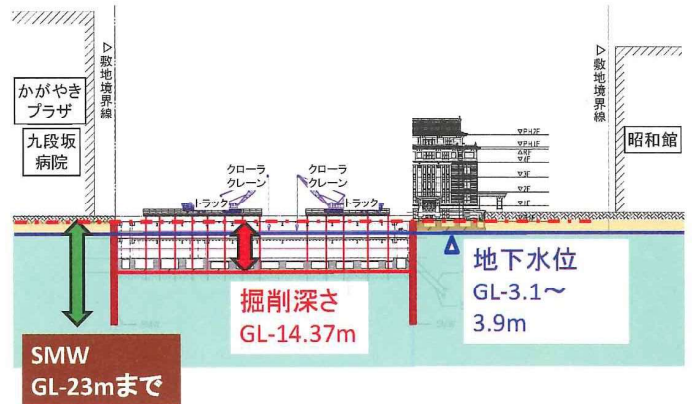
1段目山留め計画平面図・各種測定計画図 | Earth retaining (the first step) plan and planning for various measurements.



3段目山留め計画平面図 (アースアンカー) | Earth retaining (the third step) plan (Earth anchors)



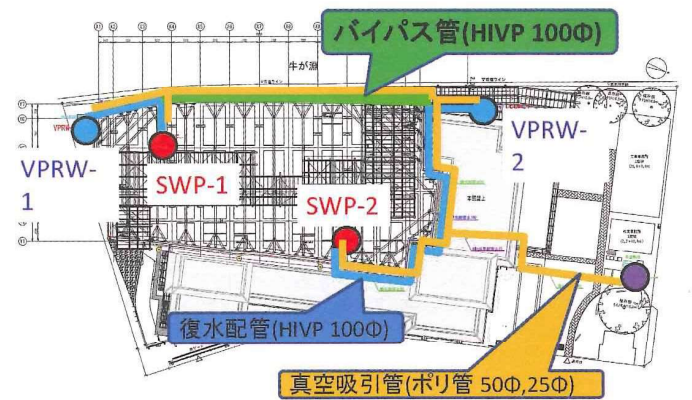
保存棟際SMW施工状況。 | SMW construction on the edge of the preserved building.



掘削状況図 | Excavation depth planning.



3次掘削施工状況。 | The third excavation work.



地下水処理計画 | Groundwater treatment plan.



3次掘削施工状況(全域)。 | The third excavation construction (whole area).



保存棟の荷重による山留め変位に対して計画したアースアンカー施工状況。 | Earth anchor planned against displacement of the earth-retaining due to the load of the preserved building.